REMARKS

Claims 1-3 are pending in the application. Claims 2 and 3 are withdrawn. Claim 1 is rejected. Claim 1 is herein amended merely to more clearly articulate the invention; No new limitation or new matter has been entered.

Claim Rejections - 35 U.S.C. §102

Claim 1 is rejected under 35 U.S.C. §102(b) as being anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious over Ota et al. (U.S. Patent No. 6,234,763). The Examiner asserts that Ota et al. teaches each element of claim 1. The Examiner considers the control valve 60 as a constant differential pressure valve.

Applicants respectfully disagree with the rejection because not all of the claimed limitations are taught or fairly suggested by the cited reference. Applicants submit that the Examiner has incorrectly characterized portions of the cited reference.

Applicants note that claim 1 recites a combination of a flow rate control compressor and a normal charge-type expansion valve, characterized in that a control valve thereof comprises a proportional flow rate control solenoid valve and a differential pressure valve.

For reference, Applicants note there are four known control methods employed in the variable displacement compressor. A first method is to detect suction pressure Ps, and then control pressure Pc in the crankcase such that the suction pressure Ps becomes equal to a predetermined value. An example of this method is Ota et al. (United States Patent No. 6,234,763; see Column 1, lines 20-23) recited by the Examiner.

A second method is to detect differential pressure between discharge pressure Pd and suction pressure Ps, and then control pressure Pc in the crankcase such that the differential

pressure becomes equal to a predetermined value. An example of this method is Japanese Unexamined Patent Publication (Kokai) No. 2001-132650 described in the present application.

A third method is to detect differential pressure between discharge pressure Pd and pressure Pc in the crankcase, and then control the pressure Pc in the crankcase such that the differential pressure becomes equal to a predetermined value. An example of this method is Japanese Unexamined Patent Publication No 2001-132650 described in the present invention.

A fourth method is to control pressure Pc in the crankcase such that a discharge flow rate becomes equal to a predetermined value. An example of this method is Japanese Unexamined Patent Publication (Kokai) No. 2001-133053.

Applicants note that the air conditioning system recited in claim 1 is directed to a variable displacement compressor that performs flow rate control such that the discharge flow rate becomes equal to a predetermined value, and is quite different in the control method from a variable displacement compressor disclosed in Ota et al., recited by the Examiner, in which suction pressure is controlled to a predetermined value.

Applicants note that, as the expansion valve used in the air conditioning system, there are two known types: a normal charge type and a cross charge type. Irrespective of the control method of the compressor, the cross charge type is used in Ota et al., so that liquid refrigerant returns so as to prevent the compressor from being damaged due to lack of refrigerant-carried compressor lubricant when cooling load is low.

In contrast, Japanese Unexamined Patent Publication (Kokai) No. 2001-133503 disclosed, for the first time, that the variable displacement compressor of the type which controls the discharge flow rate to a predetermined value can be used in combination with the normal charge-type expansion valve which is excellent in cooling efficiency.

To provide control such that the discharge flow rate is held at a predetermined value, the discharge flow rate is determined based on the following principles: Assuming that A represents a flow path cross-sectional area of a refrigerant passage set to extend between two arbitrary points in a refrigerant circulation circuit, and ΔP represents differential pressure across the refrigerant passage, the flow rate Q of refrigerant flowing through the refrigerant passage is proportional to the product of A and ΔP. Based on this fact, by detecting the differential pressure ΔP across the refrigerant passage it is possible to determine the flow rate of refrigerant flowing through the refrigerant passage. Therefore, according to this variable displacement compressor, the pressure on an upstream side of the refrigerant passage and that on a downstream side of the same are detected, and based on the differential pressure between the detected pressures, the pressure in the crankcase is controlled such that the discharge flow becomes constant. On the other hand, although the variable displacement compressor recited in claim 1 is the same flow rate control type, means thereof for performing flow rate control is comprised of a proportional flow rate control solenoid valve and a differential pressure valve. The proportional flow rate control solenoid valve varies the flow path cross-sectional area A of a refrigerant passage, and the constant differential pressure valve controls the pressure in the crankcase such that the differential pressure developed across the proportional flow rate control solenoid valve is constant, to thereby control refrigerant flowing through the proportional flow rate control solenoid valve to be delivered to the condenser to a constant flow rate.

Applicants note that this construction of the variable displacement compressor in which the flow rate control is performed by the proportional flow rate control solenoid valve and, the differential pressure valve is not disclosed or suggested in any of the references cited by the Examiner. Therefore, Applicants submit that the variable displacement compressor as recited in

claim 1 is quite different from that disclosed of Ota et al. in which the pressure in the crankcase is controlled such that suction pressure becomes constant.

Further, a control valve 60 in Ota et al. is configured such that a bellows 66 senses suction pressure Ps in a suction chamber 38, and depending on the value of the sensed suction pressure Ps, the lift of a valve element 72 is controlled to control the flow rate of refrigerant supplied from the discharge chamber 39 to a crankcase 15, whereby the pressure Pc in the crankcase 15 of the variable displacement compressor is controlled such that the suction pressure Ps becomes equal to a predetermined value set by a solenoid valve 51. This means that the control valve 60 **can not be** the constant differential pressure valve asserted to be by the Examiner.

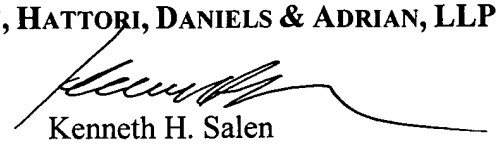
In view of the aforementioned amendments and accompanying remarks, Applicants submit that that the claims, as herein amended, are in condition for allowance. Applicants request such action at an early date.

If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned attorney to arrange for an interview to expedite the disposition of this case.

If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP



Kenneth H. Salen
Attorney for Applicants
Registration No. 43,077

KHS/lde
1250 Connecticut Avenue, NW
Suite 700
Washington, D.C. 20036
(202) 822-1100
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